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Scientists at Los Alamos are simulating the behavior of atoms to learn more about the properties of silicon. The image above shows the side and top view of a silicon wafer at about 400 femto seconds after it has been bombarded, or implanted, by 11 silicon atoms that have incoming energies of 15 keV. The silicon wafer has surface dimensions of 100x100 atoms. The atoms shown below the wafer's surface depict the damage caused by the implants. Results from this simulation and others will contribute to future designs of silicon computer chips. See the back cover for sequential images.

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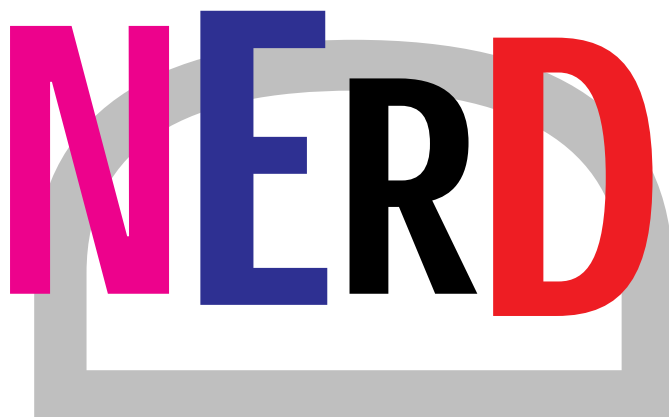
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NERD: Providing Automated Network Anomaly Detection and Notification

The goal of the Network Event Recording Device (NERD) is to provide a flexible, reliable, and autonomous system for network logging and notification when significant network anomalies occur. The NERD is also charged with increasing the efficiency and effectiveness of currently implemented network security procedures.

While it has always been possible for network and security managers to review log files for evidence of network irregularities, the NERD provides real-time display of network activity as well as constant monitoring and notification services for managers. Similarly, real-time display and notification of possible security breaches will provide improved effectiveness in combating resource infiltration from both inside and outside the immediate network environment.

Background

NERD was begun by Sally Wilkins (CIC-8), Craig Idler (CIC-5), and Ben Crane (CIC-5) in May 1991. According to Sally Wilkins the originally defined goals of the NERD were to provide "a service on a network for recording network events and effecting some appropriate notification that is determined by the criticality of the events. NERD may be a stand-alone host or may be one of several network services on a host dedicated for such tasks."

While the basic functional description and purpose of the NERD has not changed substantially since that time, the implementation and features of the NERD have undergone radical revisions in order to make it a flexible, production quality system addressing the ever-widening problems of network management and security. The rewrite of the NERD, including the development of several new and important aspects of the system, was completed at Los Alamos National Laboratory (LANL) by David G. Simmons under the direction of Ron Wilkins and Dale Land in the Network Engineering Group (CIC-5). Ongoing work to continuously upgrade the capabilities and services provided by the NERD, as well as to address new and emerging network and security issues, is also being conducted.

Environment

The target environment for the NERD system is the Integrated Computing Network (ICN) at LANL. The ICN is the central computing network, serving over 9000 users on a variety of supercomputers, mainframes, minicomputers and workstations as well as file storage devices, communications interfaces, routers, bridges, and terminals. The ICN at Los Alamos is one of the largest and most complex computing resources in the world. The systems within the ICN use a variety of operating systems, including UNICOS, AIX, ULTRIX, UNIX System V, BSD UNIX 4.3, and Sun's Solaris operating system, among others. The variety of operating systems present in the ICN was a central driving force in the final design of the NERD system.

Functional Overview

The NERD is not necessarily, as the name might imply, a single entity but is rather a suite of programs that, when run together, constitute a sophisticated network event monitoring system, a notification system for significant network events, and a self-monitoring and diagnostic system to ensure reliable operation. The system also provides an intuitive, interactive, window-based interface to the information maintained by the NERD.

In order to minimize system maintenance requirements and to allow a high degree of portability, the NERD is built on a standard Berkeley System Designs 4.3 UNIX syslogd (system logging daemon) process, making the NERD effectively blind to hardware and operating system differences across a heterogeneous network such as the ICN at Los Alamos. The modified process is not run on all hosts on the network but only on the NERD data server, allowing the NERD to provide the full range of its services to all hosts, or a specified subset of hosts, without software modifications.

The NERD provides host-authentication routines which allow a high degree of granularity in the control of access to the various logging capabilities allowed to remote hosts, of notification abilities granted to remote hosts, and of access to the NERD's log files. NERD uses the network log files generated on the various service nodes to monitor network activity. Since the NERD uses existing sources of data, we were able to incorporate them into the NERD with little impact on the client systems.

Network Efficiency

Given the dependency of LANL's Central Computing Facility (CCF) on networked computers and network technology, a system for effectively managing those networks was required. Loss of a section of the network, or communications problems between segments of the network, have the potential to cause large-scale problems throughout the facility, and a set of tools for overseeing the functioning of the networks, and the machines on those networks, was seen as a critical area for improved network management. In addition to general network monitoring, it was also important to be able to monitor the status of hardware on the networks in order to be able to avoid system crashes. The economic benefits of improved network security and performance are well recognized. Improved efficiency in managing networks, and network resources, has the potential to decrease the financial impact of network maintenance and management on network providers and network managers.

The problem of effective network management applies equally to large-scale computing facilities and local and wide area networks. The management of resources in a large computing facility, such as the one at Los Alamos, with its high-speed networks of supercomputers, mainframes, and minicomputers, can be significantly impacted by mismanagement of network resources. A simple example of network resource mismanagement is an infinite loop in E-mail forwarding, creating a "cycled user." A user forwards his mail from machine X to machine Y. Forgetting he has done this, he later forwards his mail from machine Y to machine X. Though most mail protocols will age messages and discard them, the effect of large numbers of cycling E-mail messages on a network can be substantial. A security profiler may also see such activity as a potential security violation and take unwarranted action against a user or a series of hosts on the network to curtail the activity. In this way, resource degradation on even small local area networks of workstations can significantly reduce productivity and drive up the cost of doing business.

By reducing the difficulty of network resource monitoring and management, and therefore increasing the network managers' efficiency, the NERD has the potential to realize significant time and resource savings.

Security Enhancement

An important, and often overlooked, avenue to increased security lies in the simple management of networks and their associated resources. Even using the most advanced network security technology available will not guarantee adequate security unless effective network management procedures are developed and followed. Issues of network security and resource management are of paramount importance in the CCF. As with resource management, security management has the potential to directly influence the cost of maintaining and providing network services. Furthermore, even small breaches of security can lead to large-scale financial losses to network providers.

Given the growing presence of open systems, a large majority of which are based on UNIX, and the inherent weaknesses in UNIX, providing effective means of management in distributed, open systems becomes an increasingly important commitment. While security of the UNIX operating system is increasing, the same cannot always be said for users and applications on those systems. It is therefore imperative to implement a network-wide system of auditing and control to ensure adequate security and management of users and processes on open systems. While much of this functionality already exists, often the data generated and stored in log files is never adequately examined because of the lack of an effective interface to those files.

Notification

NERD is designed to notify network managers of significant network events via electronic mail, digital pager, public address announcements, and video displays. Once validated for particular services by the NERD, a system manager can customize his or her system to provide varying degrees of notification should significant events occur. Again, this customization can, in all but the most elaborate cases, be performed without specialized software. In the event that an important network event occurs and a system manager has not specified a notification procedure, the Network Operations Center (CIC-5) on-call operator will be notified of the event.

Implementation

In designing a new network monitoring system, we felt it was imperative to design a system that could be rapidly integrated into existing network monitoring technology. Such a design approach would, upon implementation, maximize the actual use of the system and minimize the impact on users. Requiring all systems desiring to use the NERD's monitoring and notification systems to implement new software would, we felt, place an undue burden on system managers and increase the maintenance requirements to such a level as to make the system impractical. As with any system, the easier it is to integrate the system into existing protocols and practices, the more likely it is to be used, and the more rapidly it will be used network-wide.

In order to make remote system modification unnecessary, the NERD is based on a modified Berkeley UNIX syslogd process. By using a standard, well-known, and widely used network logging system, the NERD is able to be integrated quickly into an existing network structure without large-scale modifications to that structure. Network-wide software modifications are not required when running the modified syslogd process on one machine. This approach allows for the rapid integration of the NERD notification capabilities to existing systems.

User Interface

NERD provides a graphical user interface for real-time monitoring of current network events as well as reviewing past network logs. The interface, called Nerdint, provides a live connection to the NERD, giving the user an up-to-date view of network activity. This interface is customizable by each user, allowing managers to view almost any redefinable subset of network events as they occur. By running this interface, a network manager can immediately see color-coded priority messages relating to his or her system.

In addition to providing real-time monitoring of network events, the Nerdint allows network managers to notify others of significant network events directly from within the Nerdint. In order to make notification easier, the Nerdint provides an interface to the Los Alamos Trouble Ticket System, the LANL Digital Paging system (CAPI), and standard electronic mail. Users can forward highlighted messages within the NERD to any of these systems without leaving the Nerdint windowing system.

Self-Diagnostics and Monitoring

In order to provide highly reliable service, and to minimize the chances of lost data, the NERD has a complete set of self-diagnostic and monitoring processes that continually check the critical portions of the NERD's system. Interruptions in service availability from any of the NERD processes are logged and an attempt is made to restore service. Should a service restart be unsuccessful, the self-diagnostic processes begin notification procedures to alert system managers to potential problems on the NERD.

At regular, configurable intervals, the diagnostic processes monitor critical NERD system parameters. Some of the systems monitored continuously are the disk space availability on partitions crucial to NERD logging, the status of the network interfaces crucial to NERD functioning, and the status of crucial NERD processes such as syslogd and driver.

For more information about NERD, access the following Web location:

<http://info-server.lanl.gov:52271/usr/u111241/nerdpaper.html>

David Simmons, david.simmons@west.sun.com
(505) 662-4767

Distribution List for On-Line BITS

First of all we would like to thank all the readers who canceled their hard copy subscription to BITS and are now using one of the on-line versions. Please refer to the article in the May issue titled "Welcome to On-Line BITS" if you need information about how to make the transition from hard copy to the on-line versions.

An advantage the hard copy version had over the on-line versions was that its arrival in the mail served as a reminder that the newest issue was available. We now have a method to notify you when the newest on-line versions are available. This notification is accomplished through Listmanager, a service provided by the Network Group (CIC-5) for creating and managing electronic distribution lists. Listmanager is designed for users who want to maintain their own distribution list on a Laboratory-supported production machine and have that list created according to their own specifications. Distribution lists created on Listmanager are available to the general public, which means anyone on the Internet can access the list. Listmanager is also fully integrated with the Laboratory's electronic mail registration (EMR) system. (Refer to the June '94 BITS article titled "Distribution Lists for E-Mail Users" for more information about Listmanager.) Once you join the BITS electronic distribution list, you will receive an E-mail notification each month to let you know that the newest on-line versions are available.

Subscribing to BITS Electronic Distribution List

To join the electronic distribution list for notification of BITS on-line availability, follow the instructions below. These instructions and accompanying figure were designed around the Eudora E-mail utility but are applicable to other E-mail utilities, such as ALL-IN-1 or Notes.

1. Open a new message within your E-mail software package. Your personal E-mail address should already be entered in the "From:" line.

2. At the "To:" line in the E-mail header (see Figure 1), enter

`listmanager@lanl.gov`

Note: Listmanager ignores anything entered in the "Subject:" line, so you can leave it blank or enter a subject for your own reference.

3. In the body of the E-mail (see Figure 1), enter

`subscribe bits-info`
`end`

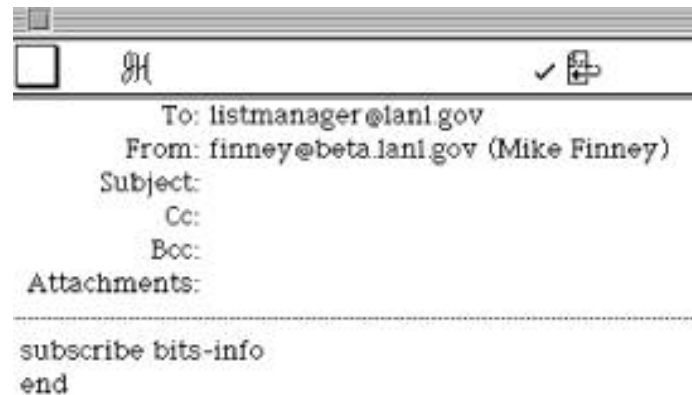


Figure 1. Subscribing to the BITS Electronic Distribution List

4. Select "Send" to complete the process.

Unsubscribing to BITS Electronic Distribution List

If at any time you wish to remove yourself from the BITS electronic distribution list, follow the instructions below. These instructions and accompanying figure were also designed around the Eudora E-mail utility but are applicable to other E-mail utilities, such as ALL-IN-1 or Notes.

1. Open a new message within your E-mail software package. Your personal E-mail address should already be entered in the "From:" line.

2 At the "To:" line in the E-mail header (see Figure 2), enter

`listmanager@lanl.gov`

Note: Listmanager ignores anything entered in the "Subject:" line, so you can leave it blank or enter a subject for your own reference.

3. In the body of the E-mail (see Figure 2), enter

```
unsubscribe bits-info
end
```

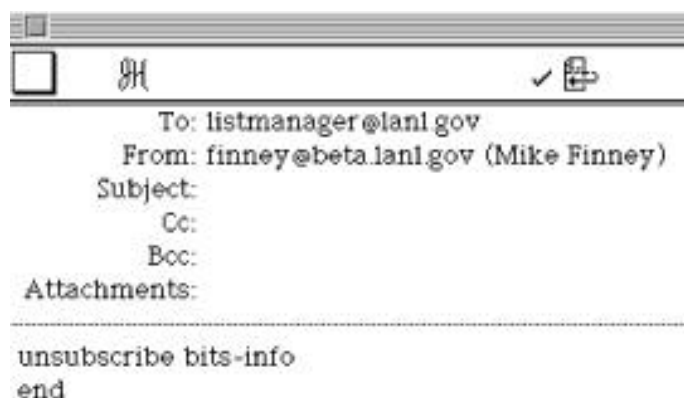


Figure 2. Unsubscribing to the BITS Electronic Distribution List

4. Select "Send" to complete the process.

The primary purpose of the BITS electronic distribution list is for notification of on-line availability; however, we may also use it for special announcements of interest to the BITS readership.

Mike Finney, finney@lanl.gov, (505) 667-2241
Communications Arts & Services (CIC-1)

Getting the Most Out of PVM

PVM (parallel virtual machine) was ultimately designed for heterogeneous computing across as many computing resources as the user can access. However, the features of PVM that provide this capability, namely data conversion and the PVM daemon, require additional time and work. PVM has also become a popular message-passing library for use in homogeneous computing environments. In both of these situations, some of the handling by PVM can be avoided, increasing the efficiency of the user's application. This article will examine these situations from the perspective of an experienced PVM user. For an introduction to PVM as well as other message-passing libraries, refer to the Web sites referenced at the end of this article.

The PVM Message-Passing Process

PVM employs certain steps to send and receive data via electronic messages. First, the message buffer is initialized (`pvm_init`). Second, the message buffer is packed with the data to be sent (`pvm_pkDATATYPE`). Third, the data in the message buffer is sent to the target machine (`pvm_send`). This process introduces the concepts of user space, PVM space, and computer system space. User space is the RAM memory allocated by the user's program. The PVM space is allocated as needed for buffer management. When a message buffer is initialized, space is allocated by PVM as an intermediate storage location for data that is subsequently packed. This allows for multiple packing of buffers (described below) of noncontiguous data as well as for a central location for data conversion. When a call is made to `pvm_send`, the data is transferred from PVM space to system space and then forwarded to the target machine. In certain situations, handling in the PVM space can be significantly reduced, thus reducing the time required to send a message.

Avoid Unnecessary Data Handling

One of the requirements for heterogeneous computing is that machines made by different vendors be able to communicate with each other even when those machines internally represent data differently. PVM provides a mechanism for performing such communication. However, providing this kind of communication may require data conversion, and when this occurs, computing is not occurring and the efficiency of your program is reduced. Therefore, data conversion should be avoided whenever possible.

Data Conversion

When the computing environment is heterogeneous in terms of internal data, you must set the data conversion flag when a send buffer is initialized. This is done with a call to

`pvm_initsend` with the encoding input parameter set to `PvmDataDefault`. This feature would seem to eliminate the need to worry about data conversion. However, you should keep in mind that data conversion is only necessary when data formats are heterogeneous and is not necessarily required just because the architectures are heterogeneous. For example, an IBM RS6000, HP 735, and Sun Sparc are heterogeneous architectures, but they all use the same data format. Therefore, from a PVM perspective they are homogeneous. PVM provides a simple way to determine the compatibility of data formats. From the PVM console, entering `conf` (configuration) will display the machines included in the virtual machine you have configured. The first line in this display will indicate the number of machines in the configuration and the number of different data formats.

When data formats of communicating machines are the same, PVM provides you with two buffer initialization options: `PvmDataInplace` and `PvmDataRaw`. When the data is contiguous in memory, `PvmDataInplace` allows the packing function to pack the send buffer with a pointer to the data rather than actually copying the data into the PVM space buffer. Then when a call is made to `pvm_send`, the data is copied directly from user space to system space. This packing option may also be used with multiple calls to `pvm_pack`, as long as each pack involves contiguous data. An additional plus of this buffer management is that when data from the same memory location is repeatedly sent, a situation common in time stepping applications, the buffer need only be packed once. Subsequent calls to `pvm_send` access memory via the pointer. When the data is not contiguous in memory, the `PvmDataRaw` option should be used. While this option still copies packed data into the intermediate PVM space, data conversion will not be performed.

Future plans for PVM include a faster data conversion system. Currently, PVM data conversion adheres to the External Data Representation (XDR) standard, in which the sending machine converts the data to XDR during its packing phase, and then the receiving machine converts the XDR to its own data format during the unpacking phase. A future version of PVM will utilize the "receiver makes right" system, in which the data is sent without being converted, and then the receiver makes the necessary conversion. Another feature that may be available in the near future is the `PvmDataInplace` option for packing noncontiguous data.

Combining Messages: Multiple Buffer Packing and Unpacking

PVM can pack multiple data, even different data types, from separate memory locations into one message. Of course you could do this manually, but why not let PVM take care of this memory management requirement for you? Here's how it works. The sending process simply makes multiple calls to the

appropriate packing functions. At the receiving machine, PVM can unpack the data in stages (in the same order it is packed). For example, the first integer can be unpacked, allowing the program to determine the length of the message, then PVM unpacks the remaining data appropriately, perhaps also in stages.

Be aware that the flexibility that allows the combining of messages comes at a time cost. Therefore, for situations in which this feature is not needed, PVM version 3.3 provides two new functions: `pvm_psend` and `pvm_precv`. These new functions allow for easier coding and, more importantly, yield greater performance when executing on massively parallel processing architectures, such as the Cray T3D.

The function `pvm_psend` ("pack and send") combines `pvm_pack` and `pvm_send`; `pvm_precv` ("pack and receive") combines `pvm_recv` and `pvm_unpack`. While workstations must still perform the combined functions sequentially (yielding coding conveniences), multiprocessor machines can take advantage of their special message handling hardware, often resulting in a significant reduction in time. For example, on the Cray T3D, message latencies can be reduced from 50 microseconds to 15 or 20 microseconds.

As described above, multiple packing and unpacking allows the sender to communicate to the receiver some details about the message, such as its length. The `pvm_precv` option provides this functionality with three additional output parameters: `ALen` (length of the message), `ATag` (actual message tag), and `ATid` (sending task).

The `pvm_psend` option may be preceded by calls to `pvm_pack`, which still allows for multiple packing of message buffers. The `pvm_precv` option may be used even when the message was sent using `pvm_send`. Likewise, `pvm_recv` may be used when the message was sent using `pvm_psend`.

Multiple Buffer Management

In certain situations, it may be convenient to set up multiple message buffers. For example, when multiple domain boundaries are repeatedly sent in a time stepping algorithm, a send buffer for each boundary may be set up with calls to `pvm_mkbuff`. With PVM, only one send buffer is active at a given time, so `pvm_setsbuf` lets you toggle between buffers. Maintaining multiple message buffers is especially useful when the data to be sent is contiguous in memory and the computing environment is homogeneous. The multiple message buffer lets you initialize a send buffer using `PvmDataInplace`, pack it once, and then simply make repeated calls to `pvm_send` at the appropriate places. Using the same boundary example above, assume that for each time

step boundaries are exchanged and then some computation is performed. Once the send buffer is initialized and packed, `pvm_send` is the only call necessary during each time step to send the data. Note that clean buffer management requires the user to free the buffers once they are no longer needed. This is done with a call to `pvm_freobuf`.

Structures in the C Language

PVM has no explicit mechanism for dealing with C structures. Therefore, you must manually pack and unpack a structure by data type. For example, the structure

```
struct Cell {
    double  pressure;
    int     mats;
    double  density;
} P_Cell, Cell;
```

must be packed into a send buffer as follows:

```
Cell      cell;

pvm_pkdouble( &(cell.pressure), 1, 1 );
pvm_pkint( &(cell.mats), 1, 1 );
pvm_pkdouble( &(cell.density), 1, 1 );
```

However, if “mats” could be declared as double precision, the structure packing could be packed with a single call as shown below:

```
pvm_pkdouble( &(cell.pressure), 3, 1 );
```

This packing could be especially significant for long structures when the `PvmDataInPlace` option is being used. If declaring “mats” as double precision is too inconvenient, you could group data types together. For example, the structure

```
struct cell {
    int     mats;
    double  pressure;
    double  density;
} P_cell, cell;
```

would result in the need for two calls to pack rather than the three shown above. These two calls are as follows:

```
pvm_pkint( &(cell.mats), 1, 1 );
pvm_pkdouble( &(cell.pressure), 2, 1 );
```

Promiscuous Receives

Often a task expects to receive messages from several other tasks. If this is the case, place a call to `pvm_recv` by entering “-1” instead of the task identifier of the sender. This lets the receiver accept a message from any task, thus avoiding excess synchronization. For example

```
for ( i=0; i<num_tasks; i++ ) {
    pvm_recv( tids[i], msg_tag );
    pvm_upkdouble( x[i], 1, 1 );
}
```

becomes

```
for ( i=0; i<num_tasks; i++ ) {
    pvm_recv( -1, msg_tag );
    pvm_upkdouble( x[i], 1, 1 );
}
```

A couple of warnings are in order here. First, because the promiscuous receive will accept a message from any task, careful use of message tags is required as this is the only way to differentiate between two or more messages arriving from the same task. Second, because the messages may arrive in different order for different runs, nondeterminism may creep into your code. This can be avoided by enforcing an ordering scheme separate from message arrival. For example, the message can be packed with an integer identifying the sender so that the actual data may be ordered in array `x` as shown below.

```
for ( i=0; i<num_tasks; i++ ) {
    pvm_recv( -1, msg_tag );
    pvm_upkint( sender, 1, 1 );
    pvm_upkdouble( x[sender], 1, 1 );
}
```

Bypassing the PVM Daemon

Computers can set up socket connections through which messages may be sent. However, the number of sockets a computer can set up is limited (although it can be manually increased by a system administrator). Because PVM was developed to avoid any restriction on the number of machines in a configuration, PVM sets up a daemon (`pvm_d`) through which messages may be passed (similar to the E-mail daemon). However, this feature adds overhead to message handling. PVM provides a function, `pvm_setopt`, designed to (among other options) set up direct socket connections between tasks. This allows messages to

bypass the `pvm_d`, which can significantly reduce communication time (by a factor of perhaps 2 or 3). All tasks attempting to make direct connections with other tasks must make the following call (the parent task must make this call before spawning child tasks):

```
oldvalue = pvm_setopt( PvmRoute, PvmRouteDirect );
```

PVM will then attempt to make such a connection. However, because of the limited resources on any given machine, there is no guarantee of a successful connection. If refused, your program application will continue routing messages through the PVM daemon.

Performance Analysis

Viewing execution of message-passing programs can help the user identify sections of code that may be altered in order to increase performance, as well as aid in debugging. Several tools are available for displaying a trace of your program execution. Many were described in the March 1995 issue of BITS ("PVM 3.3 Development Toolbox"). The December 1994 issue of BITS described some details of XPVM ("PVM 3.3 and XPVM Installed and Supported on the Open Cluster").

Additional Information about PVM

For additional information concerning LANL support of distributed parallel computing, see the November 1994 issue of BITS, which contains an article describing the services provided by the CIC-8 Distributed Computing team ("Distributed Computing Team Supports PVM Software ..."). Included in this article is information about how to join our mailing list (ptools@lanl.gov) and the PTools User Group. Also, refer to our team Web page more information; the URL is

http://www-c8.lanl.gov/dist_comp2/cic8-distcomp2.html

For an introduction to PVM, see

http://www-c8.lanl.gov/dist_comp2/MSGPASS/pvm.html

For an introduction to other message passing libraries, see

http://www-c8.lanl.gov/dist_comp2/msg_pass.html

For a comparison of message passing with other parallel computing paradigms, see

http://www-c8.lanl.gov/dist_comp2/DIFFUSE/diffuse.html

Feel free to send comments or questions concerning PVM to rbarrett@lanl.gov.

CIC-8 Announces Classes on Parallel Computing

The Parallel-Distributed Computing Team of the Distributed Computing Group (CIC-8) will be offering a series of one day classes on parallel computing in the coming months. Topics will range from explicit message passing techniques to object oriented methods to code debugging and performance analysis.

The first class, on July 6, will be an introduction to explicit message passing. The goals are:

- to introduce the basic concepts of parallel computing,
- to describe the types of problems that may be solved using parallelization, and
- to get users started designing and writing parallel programs using explicit message passing.

We also encourage attendees to discuss their goals in parallel computing with us so we can help them decide on a strategy for attaining those goals.

The computing environment we will use to accomplish these goals will be a network of workstations connected using PVM (Parallel Virtual Machines). This allows students to construct a parallel computing environment using the workstations that are probably available throughout their work area.

Topics for future classes are debugging tools and performance analysis, High Performance Fortran (HPF), and object oriented methods (POOMA). Details for attending these classes will be posted in future BITS articles, through LANL newsgroups (lanl.hpc), and mailing lists, as well as the CIC-8 Web page:

http://www-c8.lanl.gov/dist_comp2/cic8-distcomp2.html

Or you may contact Richard Barrett (rbarrett@lanl.gov) or Marydell Tholburn (marydell@lanl.gov).

Richard Barrett, rbarrett@lanl.gov, (505) 667-6845
Distributed Computing Group (CIC-8)

Things Mother Never Told You about Cray Computing at LANL

Recharge Rates for Crays

Operating within the Computing Group (CIC-7), the UNICOS Systems team administers five Cray YMPs that are available to users on a recharge basis. These machines are labeled delta, epsilon, gamma, rho, and zeta. (Our other Crays, pi and tau, are for restricted usage.) As of FY95, Cray CPU recharge rates fell below the \$100 mark; charges are \$93/CPU-hour for batch computing on all of our production machines except for gamma, which costs \$80/CPU-hour. Interactive computing rates are \$131/CPU-hour and \$112/CPU-hour, respectively. For charging purposes, only work submitted through the PROD utility is considered batch computing. For more details on rates for ICN services, see the LANL home page via Gopher, Mosaic, or Netscape and search under "Computing at LANL/Services/Rates for CIC Services" or contact the ICN Consulting office at 667-5745.

You might wonder why the rates for gamma are less than those for the other machines. Gamma's CPUs are identical to those on the other YMPs and both gamma and the other YMPs run on a 6.0-nanosecond clock. The rates are smaller because gamma uses a slower, cheaper memory technology known as DRAM. Longer fetch times cause the CPU to spend more time waiting for data. The exact delay depends on the application, but on average processes take 15% longer to run. The reduced rate for gamma compensates for the longer CPU times, ensuring that, on the average, applications will cost the same to run on gamma as they would on any other YMP.

The upside to gamma's slower memory is that we have plenty of it — two gigawords of 64-bit core memory—which is perfect for fine meshes and three-dimensional calculations. Smaller, open-partition jobs should be submitted to rho; your codes will run faster, and the work load there is lighter.

Production Computing

If you aren't using PROD to submit your long-running jobs, you may be missing out on the most efficient way to perform UNICOS computing at Los Alamos. Long-running jobs run more reliably through the batch system, the turnaround time for batch work is often faster, and batch computing is less expensive.

Batch, or production, computing is scheduled for the Crays by a pair of VAX computers, one in each network, known as PROACS machines (for production and accounting). When used to submit a production job, the PROD utility copies the controlling script file for the job, as well as information on job size, running time, and user identification, onto the PROACS machine. PROACS holds the job locally until enough room exists to run the job on the targeted Cray. (PROACS can also schedule the first available Cray if the user requests it.)

Because PROACS waits for room, the Crays run an optimally efficient load during batch periods, from 18:00 to 06:00 during weekdays and 24-hours-a-day on weekends and holidays. Production jobs are checkpointed for scheduled interruptions (dedicated systems downtime and preventative maintenance), and in many cases the system is able to checkpoint these jobs just prior to hardware failures or operating system panics. Checkpointed jobs are then restarted when the machine is returned to service. Because production work is designated for 90% of system resources at night and on weekends (and for "crack filler" during the day), production jobs often finish in less wall-clock time than jobs submitted interactively.

The PROD utility also allows you to check the status of submitted jobs, rearrange the priority of work within queues, signal and/or abort jobs, and create job dependencies. For more details, see the PROD manpage which is available on any production YMP.

Temporary File Systems: /tmp Versus /usr/tmp

Since permanent, home directory space is very limited (quotas are 10 megabytes), most applications create working files in one of the writeable temporary file systems: /tmp or /usr/tmp. We strongly recommend that you use /usr/tmp only for scratch space. The /usr/tmp file system is cached, so reads and writes are much more efficient, and it is 100 times larger than /tmp. The /tmp file system exists primarily for system maintenance and to accommodate older utilities. To ensure that enough space is available for all users, both temporary file systems are purged each night of all files not accessed within 48 hours. If either file system fills up, the system stops. While it is permissible to "touch" files to keep them on disk longer, beware of treating these temporary file systems as permanent storage space. Temporary file systems are quite volatile, and are often lost due to disk failure or system



*The CIC-7 Worker Systems team: Front, L to R: *Tim Harrington, Art Mascarenas, *Rusty Brown, Randy Bremmer, Tom Klingner; Back, L to R: Velda Volz, Ray Miller, Joe Rieken, Richard Klamann, *John Baillie, Amos Lovato; Not shown: Jim Lujan, Phil Salazar (*Cray Research, Inc. employees).*

crashes. The common file system (CFS) is the best place to store large, permanent files.

All the News That's Fit to Print

We are now using the standard UNIX "news" utility to inform our users of significant events and system changes. One always walks a thin line here—present too much information and users will ignore it as it scrolls off the screen; present too little information and users will miss out on system improvements and changes. We've chosen an intermediate route. Upon log-on, you are shown summaries of all your unread news articles. To see the details, you simply type `news | more`. Once you view the details behind a summary, the summary will no longer be shown on subsequent log-ons. Previously read news articles can be viewed by entering `news` followed by the article file name (e.g., `article filename`). Articles are kept under `/usr/news`.

CIC-7 Worker Systems Team

The CIC-7 Worker Systems team (see photo on page 9), which includes the UNICOS Systems team, provides systems administration, analysis, and system programming support for LANL's production supercomputers. The emphasis within the team is on production quality. We provide scientific computing services 24-hours-a-day, 7-days-a-week. These services are based on proven technologies, a stable environment, and mature hardware and software. Our platforms include six Cray YMPs, a Cray T3D, two CM-200s, and an array of supporting minicomputers and workstations. We support an active user community of over two thousand and, at peak times, two to three hundred active compute sessions.

The achievement of our twin goals—stability and system availability—masks much of our activities. Local operating system modifications are many and vary from those required by Laboratory recharging methods (accounting, allocations, authorization) to network and security integration (authentication, registration, CFS, PAGES) and range from normal administrative activities (backups, purges, notifications) to unique requirements from our user community (reconnect, production control, CPU and memory scheduling). These modifications are maintained from one generation of hardware to the next, from one release of the operating system to the next, and in the face of ICN network and policy changes (such as the simple intermachine protocol (SIMP) removal and the ICN-2 network split), with as little inconvenience to our user community as possible. To a large extent, the success of our operation is measured by the extent to which our users take us for granted.

Richard Klamann, rmk@lanl.gov, (505)665-3181
Computing Group (CIC-7)

OFVAX ALL-IN-1 E-Mail System Renamed and Upgraded

On May 30, 1995, the OFVAX ALL-IN-1 E-mail system was renamed CANYON and moved to a new DEC Alpha cluster. The CANYON cluster uses new hardware, new mail support software, and the latest version of ALL-IN-1 (V3.1). If you are using a domain name server (DNS) to access OFVAX, you should begin using the new node names, `hondo` or `guaje`, to access CANYON (see table below). Note that the IP (Internet Protocol) address for these two nodes has not changed.

Old Node Name	IP address	New Node Name	IP Address
<code>ofvax.lanl.gov</code>	128.165.3.9	<code>hondo.lanl.gov</code>	128.165.3.9
<code>ofvax2.lanl.gov</code>	128.165.3.10	<code>guaje.lanl.gov</code>	128.165.3.10

In addition to changing the old node names, we've added a new node, `bayo.lanl.gov`, and established `canyon.lanl.gov` as an alias (see table below). Note that either of these node names will access the CANYON cluster.

New Node	Alias	New IP Address
<code>bayo.lanl.gov</code>	<code>canyon.lanl.gov</code>	128.165.3.22

If you are using a local host file to access OFVAX, you should change the node name in your file to reflect our current configuration. This will ensure your access to CANYON.

MICOM access has changed from OF to CAN; however, OF will remain available temporarily as a hidden option. Telnets to `ofvax` and `ofvax2` will also automatically access the new CANYON cluster during the transition phase.

Outgoing off-node mail from the new CANYON cluster will show a return address as follows:

`user@canyon.lanl.gov`

If you send or reply to a `user@ofvax.lanl.gov` address, mail will be correctly routed to the new CANYON cluster (`canyon.lanl.gov`) during the transition phase.

Randy Bailey, rlb@lanl.gov
Network Group (CIC-5)

Tracking Waste Management with Integrated Databases

Anyone who's tried to dispose of motor oil recently knows that waste disposal is not always easy. Disposal processes infinitely more complex than that are part of LANL's everyday business. The LANL groups responsible for waste management are Chemical & Mixed Waste Science (CST-5) and Solid Radioactive Waste Management (CST-14). To meet environmental, safety, and health (ES&H) requirements, most of the waste produced at LANL must be characterized and accompanied by completed disposal forms before it will be accepted for disposal or storage. In the past, the information needed to complete these forms was not always easy to obtain. Over the past few years, however, that situation has changed.

The Waste Management System

In 1990 the Facility Operations-Waste Management Facility Manager (CST-27) hired programmers from Applications Programming (CIC-12) to help assess CST-27 computer capabilities and apply them to waste management issues. The database programming team (see photo) responded by coordinating the installation of a network comprising several dozen PCs spread along a 4-mile corridor, installing two database servers, and proposing and developing a group of Oracle databases that make up the Waste Management System. This system comprises the following databases:

- Chemical and Low Level Waste (CHEMLL) Database,
- TRU Waste Database, and
- Waste Profile Database.

"The Waste Management System was designed to address all waste management operational information needs through the development and support of computer applications," says Ron Krantz, team leader of the programming project.

The Waste Management System stores and disperses all the information needed to comply with ES&H regulations, reporting requirements, and overall safety of the work environment. It tracks waste from its source at the generator's site to its ultimate storage, treatment, and disposal. The system offers ad hoc database queries, standard report generation, nonconformance information, data entry verification, and the ability to generate data matrices, graphs, and histograms. Additionally, the system allows users to manipulate, maintain, and view data and to print identification labels for waste containers.

Future Projects

In the future, the applications programming team hopes to make the Waste Management System, already running on the open network, available on a Web server. In addition to their work for CST-27, the team provides services for CST-5, CST-14, and CST-17. These services include maintaining software and hardware security, training users on the Waste Management System, tailoring Oracle applications to changing customer needs, and performing system management functions on the database servers.

Applications Programming Group

Development of the Waste Management System is one of many projects at LANL that utilize programming expertise from the Applications Programming Group. CIC-12 provides LANL with short- and long-term programming support that spans all platforms and technologies. The group's services include software development; database design, development, and maintenance; basic research tools and programming support; graphics coding; data visualization; and applied supercomputing. For more information, contact Gary Clark at 665-4613.

Dawn Hipsh, dhipsh@lanl.gov, (505) 665-3656
Communications Arts and Services (CIC-1)



CIC-12 Database Computing Team: L to R, Marion Cohen, Marie-Louise Hadden, Ron Krantz, and Veronica Atencio.

Clues for Summer ICN Users: Sumer is icumen in, Lhude sing cuccu!

The Computing, Information, and Communications (CIC) Division welcomes all summer staff and visitors to the Laboratory. A fair number of changes in the operation and use of CIC facilities and services have taken place since September 1994. In the present article, we highlight some of the changes you may need to know about, along with some reminders of unchanged services you may also need.

BITS Articles

Probably the most efficient way to acquaint yourself with these changes is to browse the issues of BITS (Computing and Communications News) for September 1994 through May 1995. Issues of BITS may be found on-line via Gopher, Mosaic, and Netscape. From the LANL home page (<http://www.lanl.gov/>), select "Computing at LANL" and then "BITS."

Useful BITS articles include the following:

- The ICN2 Project (September 1994)—Discusses the abandoning of the intermachine protocol (SIMP) in favor of the transmission control protocol/Internet protocol (TCP/IP).
- New E-mail Server: POP+ (October 1994)—An extended (beyond basic POP service) E-mail server.
- What's So Smart about a Smartcard? (December 1994)—Discusses the increasing LANL use of these devices that generate one-time log-on passcodes, thereby greatly increasing security.
- Smartcards: They Keep Going (February 1995)—LANL machines accepting Smartcard passcodes for log-on.
- UNICOS Security Tidbits in the ICN2 (February 1995)—Discusses changes in procedures in using the secure UNICOS Crays.
- CIC Consultants: Who to Call (April 1995)—Outlines the functions of the four CIC consulting teams.
- New Networking Document for ICN Users (April 1995)—Compendium of network services at Los Alamos.

The Network Split

In addition to the change of network protocols to TCP/IP, the two major networks—open and secure—were totally severed from one another. Also, there are now two disjoint CFS (Common File System) machines, one to serve the open network and the other to serve the secure network. Prior to the split, it was possible to have unclassified access to both the open and secure Crays from a single terminal connection. This is no longer possible. Open access is available either from an open LAN (Local Area Network) or from the open TIG (Terminal Internet Gateway) using SLIP (serial line internet/interface protocol) or from an open MICOM port. Secure access is available from a secure LAN or a secure MICOM port.

Telephone Directory

One of the most-missed utilities has proved to be "fone," which gave access to the Laboratory telephone directory. This functionality is now provided (in both the open and the secure networks) by the UNIX finger command. For usage information, execute `finger help@lanl.gov`. The telephone directory is also available as "Phone Book" which is listed on the LANL home page via Gopher, Mosaic, and Netscape.

Useful CFS Files

Some useful CFS files (all of which are Los Alamos standard text files) are kept on both CFS machines:

- `/userpool/sallroots`—A listing of all CFS root nodenames in both the open and secure networks.
- `/userpool/icnlist`—A listing of all users of the ICN.
- `/userpool/subyname`—An alphabetical (by last name) listing of all ICN users that also includes organizational associations and telephone numbers.
- `/userpool/subyzno`—Same as above, but ordered by ICN user number.
- `/userpool/scumprnt`—Same as `/userpool/icnlist` but also includes all past (inactive) users of the ICN.

CIC Consulting Teams

To assist computer users, CIC Division has established four consulting teams:

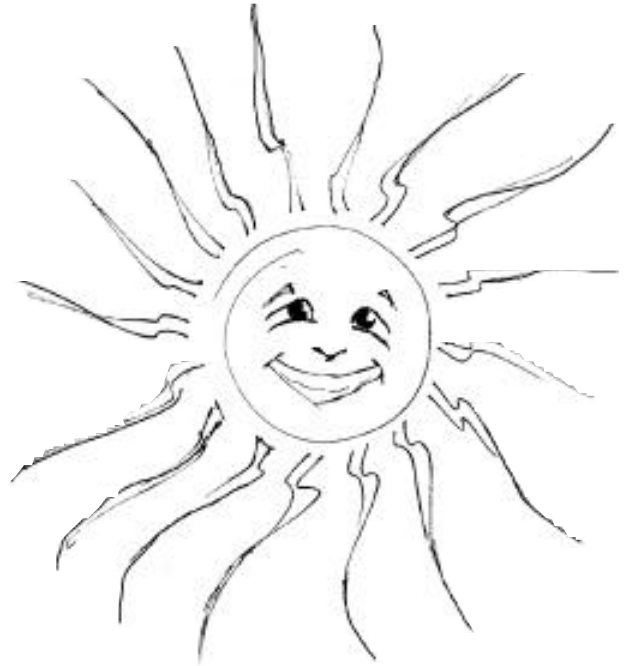
- CIC Customer Service Center—(505) 665-4444 or cichelp@lanl.gov
- ICN Consulting Office—(505) 667-5746 or consult@lanl.gov
- Lab-Wide Systems Support—(505) 667-9444 or labwide@lanl.gov
- Desktop Support Center—(505) 667-4357

ICN Password Office

Send applications for an ICN account (user number and password) and requests for a Smartcard to the ICN Password Office at (505) 667-1805 or validate@lanl.gov.

In case of total confusion and panic, send questions to the CIC Customer Service Center. This is the front door for CIC consulting.

John Wood, consult@lanl.gov, (505) 667-5746
Customer Service Group (CIC-6)



Advanced Computing Laboratory

When first founded, the Advanced Computing Laboratory (ACL) was intended to provide an applications-driven environment for developing leading edge computing technologies, primarily in the areas of parallel and distributed computing, scientific visualization, and high-speed networking.

In December 1991, Los Alamos National Laboratory was named as one of two national HPCRC (High-Performance Computing Research Center) sites by the Department of Energy's HPCC (high-performance computing and communications) program. The ACL is the foundation upon which this center is being built. The mission of the ACL is to facilitate solution of tomorrow's complex, interdisciplinary problems in science, industry, and defense. This will be accomplished by focusing on a few Grand Challenge-scale applications, providing a unique simulation environment and advanced computational resources, having a world-class staff, and forging links with other centers of excellence.

The resources of the ACL are available to LANL employees with a demonstrated need for the unique resources that the ACL provides. In addition, industrial collaborators may seek access through a partnership with the Laboratory, which can be arranged through the Computational Testbed for Industry (CTI). Under the auspices of the DOE Grand Challenge program, other external researchers involved in the LANL-based Grand Challenge projects may also seek access. An ACL account application form is available by sending e-mail to proposal@acl.lanl.gov. The only payment the ACL requests for use of its resources is a copy of any paper or other publication with ACL acknowledgment in the publication.

ACL Machine Availability

Machine Type	Operating System	Security Partition	Machine Name(s)
FPS350X (Stardent GS2000)	STELLIX	Open	stella
FPS500	FPX	Open	blanche
ibm930	AIX	Open	ibm930
Intel iWARP	SunOS	Open	iwarp
Motorola Monsoon	SVR2	Open	monsoon
SGI ONYX	SVR3	Open	black
SGI 380VGX	SVR3	Open	panda
IBM 550	AIX	Open	noid
Thinking Machines Corp. Connection Machine CM-5*	SunOS	Open	cm5-1 to cm5-8
CRI T3D*	UNICOS 80	Open	T3D
Sun 4/670	SunOS	Open	koala
Sun 4/670	SunOS	Open	cocker
Sun 4/670	SunOS	Open	collie
Sun 4/670	SunOS	Open	pooh
* Special access rules apply.			

LANL Research Library Training

The LANL Research Library provides training for using its specialized databases. Training sessions begin at times indicated below. Classes are scheduled for half an hour, except for "Information Resources on the Internet via Gopher/WWW" which is two hours. Space is limited to 8 per session. Classes are free, but you must pre-register by calling the Research Desk at 7-5809 or sending E-mail to ref@lanl.gov; no registration required for the "Library Orientations" class. Special classes and orientations can also be arranged.

Date/Time	Subject Matter
6-1-95/1:00 p.m.	Bioscience and Biotechnology Resources
6-5-95/1:00 p.m.	How to Locate Items Listed in a Bibliography
6-6-95/1:00 p.m.	Physics/Weapons Resources
6-7-95/11:00 a.m.	MELVYL (University of California's catalog and associated databases)
6-7-95/1:00 p.m.	Library Orientation
6-8-95/10:00 a.m.	Information Sources on the Internet via Gopher/WWW
6-8-95/1:00 p.m.	GeoRef (Geology Literature, 1785 to present)
6-13-95/1:00 p.m.	Engineering/Materials Resources
6-14-95/10:00 a.m.	MEDLINE
6-15-95/1:00 p.m.	Business Sources on the WWW*
6-20-95/1:00 p.m.	Bioscience and Biotechnology Resources
6-21-95/1:00 p.m.	Science Sources on the WWW*
6-21-95/1:00 p.m.	Library Orientation
6-22-95/10:00 a.m.	Information Sources on the Internet via Gopher/WWW
6-22-95/1:00 p.m.	Finding Company Information
6-26-95/1:00 p.m.	Math/Sci (Mathematics and Computer Science Literature)
6-27-95/1:00 p.m.	GeoRef (Geology Literature, 1785 to present)
6-28-95/11:00 a.m.	MELVYL (University of California catalog and associated databases)
6-28-95/1:00 p.m.	Library Orientation
6-29-95/10:00 a.m.	Information Sources on the Internet via Gopher/WWW
6-29-95/1:00 p.m.	Physics/Weapons Resources

* Requires working knowledge of a Web Browser.

Lab-Wide Systems Training

The Customer Service Group (CIC-6) offers training for users of Laboratory information systems. The CIC-6 courses offer training for a variety of personnel including property administrators, group secretaries, training coordinators, budget analysts, group leaders, or anyone needing to access training records, property records, costs, employee information, travel, chemical inventories, etc. Refer to the table below and on the following pages for specific information about courses currently offered.

Course Registration

You must have a valid "A" or "U" level ICN password before taking any of the courses shown in the table. To register for a course, call CIC-6 Training, Development, and Coordination section at 667-9444 or send E-mail to classes@lanl.gov. You will be sent a registration form to be completed and returned.

Course Title	Date	Time	Cost	Course Number
ALL-IN-ONE Basic Electronic Messaging	6/14/95	1:30 - 5:00	\$410	Course #6882
Participants receive hands-on instruction to create, read, and print electronic mail. Participants also learn how to edit mail, create distribution lists, send mail to a FAX machine, and grant mail access to others. Prerequisite: an ICN password and an account on the OFVAX.				
Automated Chemical Inventory System (ACIS):	Scheduled Upon Request		\$410	Course #7480
Participants receive hands-on instruction to update the status (end-user, location, quantity) of chemical containers. Participants will also learn to generate chemical inventory reports by chemical name, end-user, location, and organization.				
Budget Computing System (BUCS):	6/13/95	8:30 - 12:00	\$410	Course #3527
This training is an introduction to the Budget Computing System (BUCS). Students practice generating "quick reports" and reports requiring parameter files. An introduction and demonstration of (no "hands-on") allocating and forecasting procedures are given during the three-hour session.				
Directory Information System (DIS):	Scheduled Upon Request		\$410	Course #7072
Lab-wide customers responsible for maintaining the Laboratory directory in the Employee Information System will receive hands-on instruction to update Laboratory employees, update and add non-Laboratory employees, retrieve location and address information for any employee, and print reports.				
Employee Development System - Basic Training (EDS I):	6/7/95	8:30 - 12:00	\$410	Course #5289
The course provides hands-on instruction to request course enrollment, use the on-line course catalog, retrieve training transcripts, and assign EDS authorities. The student will learn to create courses, add students to the courses, and generate several training reports.				
Employee Development System - Training Plans (EDS II):	6/21/95	8:30 - 12:00	\$410	Course #7155
Participants receive hands-on instruction to create and maintain training plans, assign assignment codes, and generate training plan reports. Attendees must have prior training in the Employee Development System (course #5289).				
Eudora Electronic Mail for Macintosh Users	6/20/95	8:30-10:30	\$205	Course #9762
This class is a hands-on class that teaches the participant how to use Eudora software to create, send, receive, and edit electronic mail messages. In addition to these procedures, the participant will learn what related settings mean and how to configure the system to meet his or her individual needs.				

Course Title	Date	Time	Cost	Course Number
Eudora Electronic Mail for PC Users	6/6/95	8:30 - 10:30	\$205	Course #9763
This is a hands-on class that teaches the participant how to use Eudora software to create, send, receive, and edit electronic mail messages. In addition to these procedures, the participant will learn what related settings mean and how to configure the system to meet his or her individual needs.				
Facilities Project Information/Work Orders (FPI/WO):	Scheduled Upon Request		\$410	Course #6996
Lab-wide users with a need to view the status of work orders and tickets in their organizations will receive hands-on instruction to request, print, and review work order, ticket and project summary information reports.				
Financial Management Information System (FMIS):	6/22/95	1:30 - 5:30	\$410	Course #8338
Participants receive hands-on instruction to "explode" and "transfer" through the costs, allocations, and outstanding commitments screens. In addition, participants will create/review reports, access the Information Manager Utility for printing reports, and learn how to assign authorities in the system.				
Hazardous Materials Transfer Tracking System for Radioactive Material (HMTTS/NRAM):	Scheduled upon request		\$410	Course # 7907
Participants receive hands-on instruction to create, update, and print the non-RAM Hazardous Materials Transfer Form (HMTF). Attendees must have completed "Completing the HMTF for Non-RAM," course #7512, sponsored by HS-8.				
Hazardous Materials Transfer Tracking System for Radioactive Material (HMTTS/RAM):	Scheduled Upon Request		\$410	Course #7993
Participants receive hands-on instruction to create, update, and print the Radioactive Materials Transfer Form (RMTF). Information about the non-RAM Hazardous Materials Transfer Form (HMTF) is included. This course is appropriate for people who fill out both RAM and Non-RAM forms. Attendees must have completed "Completing the RMTF," course #7517, sponsored by HS-8.				
Introduction to LANL Information Systems:	6/23/95	8:30 - 11:30	No Fee	Course #10118
This three-hour class is a hands-on introduction to the information systems available to Laboratory-wide users. The participants will become acquainted with Lab-wide information systems such as TRIPS and Stores, Electronic Mail, and Netscape (an interface to Laboratory information).				
Key/Core System	6/21/95	1:00 - 3:00	\$205	Course #10179
Key custodians and alternate key custodians receive hands-on instruction to add, update, and delete key and padlock information, and view assignment information and request reports. Students will also learn how to request key inventory notifications. Students must be a key custodian or alternate and have an ICN password.				
Lotus Notes Basic Concepts	6/22/95	8:30-12:00	\$410	Course #9917
This class provides hands-on instruction for Mac and PC users to use Lotus Notes software to create and send E-mail memos; fax documents; search databases; create filters, nicknames, banners, and doclinks; set defaults; and use multiple address books. In addition, participants learn how to use the memo, meetings, and discussion databases.				
On-Line Forms	6/9/95	8:30 - 12:00	\$410	Course #9756
Participants will learn to use Mosaic software to access Lab-wide information and forms. Using Jetform Filler software, participants will access, complete, and print forms such as the "ICN Validation Request," "Visitor Request for Unclassified Visits to Security Areas," and "Request for Quotation."				

Course Title	Date	Time	Cost	Course Number
Property Accounting, Inventory, and Reporting System (Advanced)	6/14/95	8:30-12:00	\$410	Course #9918
This course will include a refresher of PAIRS, advanced techniques and tips, explanation of the notification system, and report capabilities. Swap Shop, Loan Out information, and support tables will be discusses. Participants should already have a basic understanding of and know how to use PAIRS.				
Secretarial/Contract Services (SE):	Scheduled Upon Request		\$410	Course #7481
This class provides hands-on instruction for creating secretarial requests for temporary services, entering time for contract employees, and creating reports using the Information Manager Utility. The students will also learn how to review notifications and approve attendance. A training database will be used for the class.				
Signature Authority System (SAS):	6/13/95	1:15 - 4:45	No Fee	Course #7582
Managers or their designees receive instruction to assign, view, and change signature authorities (purchase request, chemical purchase, and handling hazardous material). Participants will also learn how to generate and print authority reports for their organizations.				
STORES:	Scheduled upon request		\$410	Course #3529
Participants receive hands-on instruction to search for an item in the on-line catalog by key word, part number, or exact name. Participants learn how to select items from the catalog, and place, change and cancel an order. Several methods for reviewing orders are also taught including reviewing an order in detail, scanning all orders, and reviewing back-orders.				
Travel Reporting Information Planning System (TRIPS):	Scheduled upon request		\$410	Course #4369
Class participants receive hands-on instruction to prepare travel requests (TRs) on-line and learn the print, revise, and cancel options. The participants also learn how to use the on-line approval function. The various reports available in TRIPS-II are reviewed.				

CIC Computing Classes

CIC offers a variety of computing courses for the professional development of Laboratory employees. The courses listed in Table 1 will meet at the time and the date shown. The date for courses in Table 2 are not known at this time.

Course Registration

To register: (1) check the box beside the appropriate course, (2) complete the Enrollment Information section below, and (3) follow the mailing instructions on the back of this form. Submittal of a Course Registration form does not guarantee participation in an advertised class, but it is the only way to get into the queue for notification of upcoming classes. Classes are conducted in a secure area unless noted; uncleared participants require escorts. Call the Training Coordinator at 667-9399 for more information.

Table 1 Courses with confirmed time and date

COURSE TITLE	INSTRUCTOR	COST	DATES
<input type="checkbox"/> C++ for Experienced Programmers	Michael Chase, Boulder Software Group	\$1000-\$1400	7/10/95 through 7/14/95
<input type="checkbox"/> Moving to the HP9000 Series 700/800 Systems and Network Administration	Roc Paez, HP Education	\$1825-\$2750	7-10-95 through 7-14-95
<input type="checkbox"/> UNIX (Beginning)	Ted Spitzmiller & Jeffrey Johnson	\$810	7/10/95 through 7/14/95

Note: Detailed course descriptions are provided on the following pages.

Table 2 Courses with date to be arranged (TBA)

COURSE TITLE	INSTRUCTOR	COST	DATES
<input type="checkbox"/> Fortran 90: An Overview	Walt Brainerd, President, Unicom, Inc.	\$300-\$425	TBA (a one-day seminar)
<input type="checkbox"/> Fortran 90: Training	Walt Brainerd, President, Unicom, Inc.	\$1275-\$1775	TBA (a five-day lecture/laboratory course)
<input type="checkbox"/> SUN Solaris 1.X (SunOS 4.X) Advanced System Administration	Sun Microsystems Expert	\$1750-\$2000	TBA

Enrollment Information

Name _____

Phone _____ Z-Number _____

Group _____ Mail Stop _____

Program Code* _____ Cost Code* _____

Group Leader Signature _____

**Enter program code and cost code for all courses. If you need to withdraw from a class fewer than 5 working days before the class is scheduled to begin, your group will still be charged. Substitutes may be sent, but please let the CIC Division Training, Development, and Coordination Office (667-9399) know who your substitute will be.*

Do Not Staple
Fold on This Line First



NO POSTAGE
NECESSARY
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CIC DIVISION TRAINING DEVELOPMENT
AND COORDINATION TEAM
LOS ALAMOS NATIONAL LABORATORY
PO BOX 1663
LOS ALAMOS NM 87544-9916



Do Not Staple, Seal with Tape
Fold Here

C++ for Experienced Programmers

Prerequisite: Excellent C Language programming skills.

Location: CIC-CTI classroom, TA-3, SM-200, Room 115 (open area).

Enrollment: 20 Maximum.

Topics: Major Differences and Additions to ANSI C; Building C++ Classes; Introduction to Text I/O with C++; Function Overloading; Single Inheritance; Virtual Functions; Multiple Inheritance; Operator Overloading; Creating, Initializing, and Assigning Objects; Passing and Returning Objects; Templates, Parameterized Functions, and Classes; C++ Stream I/O with the File System; C++ Course Summary.

NOTE: Some enrollments are already confirmed; other requesters are already in the queue and will be notified of availability of spaces; the first queue confirmations received will comprise the class. Those submitting new requests will be entering the queue ONLY.

Fortran 90: An Overview

Prerequisite: Competency with Fortran 77.

Location: CIC-Division Lecture Room, TA-3, SM-200, Room 256 (secure area).

Enrollment: Minimum 10, Maximum 40.

Audience: Individuals who are using or will be using the ANSI standard Fortran 90 in the course of their business.

Topics include: New source form; Array Features; Derived Types; New I/O Features; New Control Structures; Pointers; Modules; Recursion; Precision; Data Structures; Interfaces.

Fortran 90: Training

Prerequisites: Competency in Fortran 77 and access to a Fortran 90 compiler following class. Access to ICN computer with Fortran 90 compiler.

Location: CIC-Secure Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 10, Maximum 16.

Audience: Individuals who are using or will be using the ANSI standard Fortran 90 in the course of their business.

Topics: History/Overview/New Features; Procedures; Array Processing; Using Character Data; Pointers; Input/Output; and Language Architecture.

Note: All lecture topics will be punctuated with hands-on laboratory examples and opportunities for problem practice. Note: HP will supply 8 HP systems and associated software for laboratory practice.

Moving to the HP9000 Series 700/800 Systems and Network Administration

Prerequisite: Experienced UNIX system administrators.

Location: TA-3, SM-200, Room 116 (CTI Conference Room, open area).

Enrollment: Minimum 10, Maximum 16.

Audience: Current UNIX system administrators who wish to become proficient with HP-UX systems and will be administering HP-UX systems.

Description: This course is a customized, compressed, on-site presentation drawing modules from three HP Education courses. This will be a fast-paced, demanding class with topics and depth of discussions dynamically determined by the attendees.

Topics include: Using HPVUE; Introduction to HPVUE Administration; System Start Up, System Shut Down; Device Files; Creating and Using File Systems (S700/S800); Disk Partitioning; Managing Swap Space; Reconfiguring the Kernel; Installing/Updating HP-UX, After Installing/Updating HP-UX; Printers and LP Spoolers; Configuring Network Connectivity; Trouble Shooting, Networking Tools and Commands, Symptoms of CPU Bottlenecks, Memory Bottlenecks, and Other I/O Bottlenecks; Performance Tuning; LVM Performance; DB Performance monitoring and tuning; and System tunable parameters.

SUN Solaris 1.X (SunOS 4.X) Advanced System

Prerequisite: None.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 10 / Maximum 12.

Topics: TCP/IP networking model's major protocols; Monitoring network traffic; Monitoring/controlling the Address Resolution Protocol (ARP) cache; Setting up/configuring/managing Sun router and subnets; Pros and cons of TCP versus User Datagram Protocol (UDP); Configuring/maintaining Remote Procedure Call (RPC)-based files/applications; Managing client/server communications; Analyzing network configurations for performance tuning; Assessing disk loads for improved I/O throughput; Modifying file system parameters for increased disk space use/performance; Analyzing Virtual Memory, paging, swapping, RAM, and swap space usage; Evaluating NFS statistics and reconfiguring for increased performance; Tuning kernel parameters to optimize buffer cache usage; Creating/adding a custom NIS map to existing domain; and Setting up/maintaining a DNS domain.

UNIX (Beginning)

Prerequisite: Familiarity with a UNIX workstation.

Location: CIC-Division Classroom, TA-3, SM-200, Room 210 (secure area).

Enrollment: Minimum 8/Maximum 10.

Topics: Overview of the Workstation environment; Getting Started; The UNIX File System; Manipulating Files; Customizing Your Environment; The C-Shell; Editing and Writing with vi; Using the Network; Discussing NFS and NIS; Using basic system status commands; Startup and shutdown procedures; Using tar.

*Beginning UNIX—
This course has been
restructured to
address generic UNIX
information. There is
no longer a focus on
Sun operating
systems and tools.
Additional topics are
being added. This
course will probably
be offered on a
quarterly basis.*


ICNchanges Contents


Change Control for June 1995

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Schedule for Change Control

Date	Activity
June 6 (First Tuesday)	New or changed software is available in experimental (X) files on CFS for testing. This initial testing period is for uncovering problems in the software before the software is put into production. If you find a problem, please call the ICN Consulting Office at (505) 667-5746.
June 13 (Second Tuesday)	The changes become production version on <ul style="list-style-type: none"> Machine rho (UNICOS) Distributed processor beta (ULTRIX) Distributed processor ccvax (VMS)
June 20 (Third Tuesday)	If no problems are reported to the ICN Consulting Office (505) 667-5746, changes are installed on <ul style="list-style-type: none"> Machine gamma (UNICOS)
	The Department of Energy (DoE) has frozen software changes to the machines in the secure network. X files and executables will be placed on CFS as usual and users are encouraged to test these files. Executables will be installed in a staggered fashion when the freeze is lifted. The date for lifting the freeze is unknown. The CIC personnel continue addressing other DoE findings. <ul style="list-style-type: none"> Machines delta, epsilon, tau, and zeta

Note: A stop sign in front of a title is significant:



= incompatible changes; please read!

Changes**MAPPER (HP, IBM, SGI,
SOLARIS, SUN)****Function**

Generates high-quality maps, charts, tables, and presentation slides.

Change

A limited number (3) of free trials of MAPPER are now available. This means that only 3 trial versions of the product can be active at any one time (one per CPU). The free trial period is 90 days.

MAPPER relies on a proprietary graphics library called CA-DISSPLA. If you already have CA-DISSPLA installed on your workstation, then you will not have to be concerned with the free trial period. MAPPER can be made available on a permanent basis to workstations that have CA-DISSPLA installed on them.

If, after using MAPPER for while on your workstation in the free trial mode you decide you want to use it permanently, then you may purchase a run time license for CA-DISSPLA. A run time license for CA-DISSPLA costs less than a license for the entire CA-DISSPLA portfolio.

This version of MAPPER runs just like the CRAY UNICOS version does. It also produces PostScript output.

X File Access

No experimental (X) files.

To request a trial copy send e-mail to Pat Hodson at pjh@lanl.gov.

Online Documentation

To display the man page (dated 6/95), enter: **man mapper**

MAPPER Graphics Utility Summary (CIC#387, 10/90).

On CFS as: **/icndoc/ascii/smapper** ASCII Version.

On CFS as: **/icndoc/postscript/psmapper** PostScript Version.

Printed Documentation

MAPPER: Basic Features (CIC#381, GR830.3, 8/83, \$24)

MAPPER: Using MAPEDIT (CIC#382, GR830.4, 9/84, \$9)

MAPPER: Mini Course (CIC#383, GR830.2, 2/84, \$2)

ASCII and PostScript documents are also available on gopher.lanl.gov under menu items, LANL COMPUTING INFORMATION, DOCUMENTATION.

Network Services Information

This section provides information and a record of changes to the software and hardware that make up the ICN network and the services it provides. If you detect a problem, please call the ICN Consulting Office at (505) 667-5746, or send electronic mail to **consult@lanl.gov**.

ADGATE

Function

A gateway machine that allows open users to access selected administrative systems using a smartcard.

Change

On June 1, 1995 the Adgate system will be upgraded from a VAX 8250 processor running VMS 5.5, to a Sun SPARCstation 20 running SUN OS 4.1.4. This change will be transparent to users.

DECnet

The DECnet Internet Gateway (DIG) will be retired on June 13, 1995. The authoritative LANL DECnet node name and address servers will be **trtuga** at address 1.130 and **canyon** at address 1.4. To translate DECnet addresses into DECnet names, the user can use **trtuga 1.130** or **canyon 1.4**. For example,

```
$mcr ncp tell trtuga show known nodes
```

or

```
$mcr ncp copy known nodes from canyon to both using volatile
```

MONIKER

On June 1, 1995 the **moniker** application will stop printing the group and full name. After June 1 to find this information about a UNIX user, type:
finger z-number@lanl.gov.

System Information

This section provides information and a record of changes to the ICN operating systems. When changes are announced here, they may already be included in the production versions of the indicated operating systems and machines. Most of the changes are strictly internal to the systems and should not affect users. However, if you detect a problem, please call the ICN Consulting Office at (505) 667-5746, or send electronic mail to **consult@lanl.gov**.

CA-Unicenter (HP, IBM, SOLARIS)

Function

Systems Management Software.

Change

A limited number (3) of free trials of CA-Unicenter are now available. This means that only 3 trial versions of the product can be active at any one time (one per CPU). The free trial period is 60 days. If you are interested, send e-mail to Pat Hodson at **pjh@lanl.gov**.

Online Documentation

Available on the Web as: **<http://www.cai.com/products/uctrt.htm>**



Machine Tau

Beginning June 15, 1995, there will be a charge for the use of Machine Tau (Serial number 1520) and the T3D (SN 6011) that it supports. The recharge for Tau will be the same as for the other interactive Y-MPs at \$131 per CPU hour and \$5.70 per megaword hour of memory. There is currently no batch access to Machine Tau. The charge for the T3D will be \$3.00 per processor memory hour. The use of a processor on the T3D automatically includes the 64 megabytes of its memory. This charge will appear as a new sub-product charge under the name "T3D cpu-mem." There are a total of 512 processors and 32+ gigabytes of memory on the T3D machine. The Y-MP has four processors and 64 megawords of memory.

Machine Tau is dedicated to running the control and supporting software for the T3D and therefore limited to users who are developing massively parallel processor (MPP) applications for the T3D hardware.

MULTINET (VMS)

Function

MultiNet is the supported IP access package used from VMS systems at Los Alamos. Los Alamos maintains a site license with MultiNet for this software, and the Product Authorization Keys (PAK) are available on CFS.

Change

The Version 3.4A release of the MultiNet family of products for Open VMS is now available from CFS for Laboratory computers. Version 3.4A of the MultiNet family of products contains the following enhancements.

- Version 2.0 of XVIEW.

MULTINET (VMS) (Contd.)

- CIC division has purchased a site wide license for
 - PhaseIP — a product that allows DECnet messages to be routed between DECnet machines using IP as the transport. This means divisions can use DECnet and not have to pay CIC Division extra for the DECnet routing support.
 - SecureIP — This product will allow VMS machines to selectively use smartcard authentication, or Kerberos authentication or ordinary VMS password authentication.
- The PAK updates from TGV for all software packages that we have licensed site wide are available on CFS. The new license product release date is March 31, 1996 for

multinet
nfs-client
mfs-server
phaseIP
secureIP

These PAK updates have been incorporated into a DCL command procedure that will run Digital's License facility and apply the PAKs to your system.

Online Documentation

A list of Version 3.4A features and enhancements can be found in the MultiNet V3.4A Release Notes.

The following is a list of MultiNet VMS style save sets on CFS.

Multinet

On CFS as: **/multinetdist/multinet034reva/multinet034.a**
 On CFS as: **/multinetdist/multinet034reva/multinet034.b**
 On CFS as: **/multinetdist/multinet034reva/multinet034.c**
 On CFS as: **/multinetdist/multinet034reva/multinet034.d**
 On CFS as: **/multinetdist/multinet034reva/multinet034.e**
 On CFS as: **/multinetdist/multinet034reva/multinet034.f**
 On CFS as: **/multinetdist/multinet034reva/multinet034.g**
 On CFS as: **/multinetdist/multinet034reva/multinet034.h**
 On CFS as: **/multinetdist/multinet034reva/multinet034.i**
 On CFS as: **/multinetdist/multinet034reva/multinet034.j**
 On CFS as: **/multinetdist/multinet034reva/multinet034.k**
 On CFS as: **/multinetdist/multinet034reva/multinet034.l**
 On CFS as: **/multinetdist/multinet034reva/multinet034.m**
 On CFS as: **/multinetdist/multinet034reva/multinet034.n**
 On CFS as: **/multinetdist/multinet034reva/multinet034.o**
 On CFS as: **/multinetdist/multinet034reva/multinet034.p**
 On CFS as: **/multinetdist/multinet034reva/multinet034.q**
 On CFS as: **/multinetdist/multinet034reva/multinet034.r**
 On CFS as: **/multinetdist/multinet034reva/multinet034.s**
 On CFS as: **/multinetdist/multinet034reva/install.ps**
 On CFS as: **/multinetdist/multinet034reva/install.txt**
 On CFS as: **/multinetdist/multinet034reva/release.ps**
 On CFS as: **/multinetdist/multinet034reva/release.txt**

MULTINET (VMS) (Contd.)**XVIEW**

On CFS as: **/multinetdist/xview020/examples.bak**

On CFS as: **/multinetdist/xview020/xview020.a**

On CFS as: **/multinetdist/xview020/xview020.b**

On CFS as: **/multinetdist/xview020/xview020.c**

On CFS as: **/multinetdist/xview020/xview020.d**

On CFS as: **/multinetdist/xview020/xview020.e**

On CFS as: **/multinetdist/xview020/xview020.f**

Site Wide License

On CFS as: **/multinetdist/phaseip011/phaseip011.a**

On CFS as: **/multinetdist/secureip010/secureip010.a**

PAK

On CFS as: **/multinetdist/multinet033revd/multinet033.lic**

On CFS as: **/multinetdist/multinet034reva/multinet034.lic**

Documentation

New and Updated Man Pages

The following online information has been added or updated.

UNICOS Man Pages

To access a UNICOS man page, enter: **man** *command_name*, where *command_name* is the name of the command, library, routine, or utility whose man page you wish to view.

Man Page	Description
mapper	MAPPER is a general-purpose graphics utility that is part of the Los Alamos Integrated Graphics System. It was written here at Los Alamos and is based on the CA-DISSPLA Library, which is proprietary software purchased from Computer Associates.

To create ASCII files of the UNICOS man pages, use the following command to remove the special characters for bold and underlining:

UNICOS 7.0 and 8.0: **man** *command_name* | **col -bx** > *filename*

Barbara Ritchie (**bxr@lanl.gov**), (505) 667-7275
Communication Arts and Services (CIC-1)

Information About Change Control

ICN Change Control is the set of procedures that coordinates changes in the ICN to ensure quality control and smooth operation and to avoid introducing additional problems. In an environment as dynamic as the ICN, control must be imposed on the scope and timing of changes that involve many components. Please report any problems as soon as they occur by calling the ICN Consulting Office at (505) 667-5746.

The following CFS nodes are used for software that is maintained or announced through Change Control procedures. The files under **/ccx(s)/unicos** are deleted the last Friday of each month because these experimental versions become the production versions on all machines by the third Tuesday of the month. The other nodes keep the most recent versions of their respective software.

Non-UNICOS Systems	<i>/cc-node/platform/filename</i>
UNICOS Systems	<i>/cc-node/unicos/type/filename</i>

Where *cc-node* is:

ccx

Open change-control root node

examples: **/ccx/mac/ppages**
/ccx/unicos/bin7/ppagesx
/ccx/unicos/ubin7c/tedix
/ccx/vax/ppages.bak

ccxs

Secure change-control root node

examples: **/ccxs/unicos/lib8/libcftlib.a**
/ccxs/sun/ppages.tar

Where *platform* is:

alpha_osf

tar files for DEC Alpha OSF/1 machines

alpha_vms

backup save sets for DEC Alpha VMS machines

convex

tar files for Convex machines

dec_risc

tar files for DEC RISC workstations

dos

executables (**.exe**) for PC/DOS machines

hp

tar files for Hewlett-Packard workstations

ibm_rs6000

tar files for IBM RS6000 workstations

mac

binhex (**.hqx**) or MacBinary (**.mbin**) files for Macintosh computers

next

tar files for NeXT workstations

sgi

tar files for Silicon Graphics workstations

solaris

tar files for Sun Solaris workstations

sun

tar files for Sun OS workstation

ultrix

current executables to test on Beta

unicos

executable **X** files or library files for current Change Control cycle

vax

backup-save-sets for VAX/VMS systems

Where *type* is:

bin#

binary files for version # of the operating system; note that an "x" is appended to the binary filenames.

lib#

library files for version # of the operating system

u

user-supported executable files (**ex**, **ubin**, **ulib**, **udata**, **usys**)

If problems are discovered during the cycle, defective hardware or software is corrected, replaced, removed, or backed off.

Online Information

You can access complete online information about Change Control by using a web browser. You can contact the Customer Service Center at (505) 665-4444 or e-mail **cichelp@lanl.gov** for assistance.

From the LANL Home Page select Computing at LANL (<http://www.lanl.gov>). Select the following series of options from the menu:

- BITS: Computing & Communications News
 - Connect directly to the BITS Home Page
http://www.lanl.gov/computer-information/ComputingNews/bits_homepage.html
- Scroll down the Home Page to BITS: ICNchanges
You will get a new menu. Select the next menu that reflects your needs.
 - Keyword Search of all ICNchanges (?)
 - Current Issue
 - 1995 Archives
 - 1994 Archives
 - 1993 Archives
 - 1992 Archives
 - 1991 Archives

Or from the LANL Home Page select Computing at LANL (<http://www.lanl.gov>). Select ICNchanges:

- You will get a new menu. Select the next menu that reflects your needs.
 - Keyword Search of all ICNchanges (?)
 - Current Issue
 - 1995 Archives
 - 1994 Archives
 - 1993 Archives
 - 1992 Archives
 - 1991 Archives
- ICNchangesSelect "Current Issue"

JULY DEADLINE

The deadline for articles for the July 1995 Change Control is 8:00 am. Monday, June 19, 1995. Please submit items to **bulletin@lanl.gov**.



CCF Machine Availability and Downtime

Machine Name(s)	Machine Type	Operating System	Security Partition	System Availability (April 1995)	Scheduled Downtime*
delta	CRAY Y-MP8/8-128	UNICOS 7.0	Secure	99.3%	June 7 — 0400-0700
epsilon	CRAY Y-MP8/8-128	UNICOS 7.0	Secure	99.5%	June 21 — 0400-0700
rho	CRAY Y-MP8/8-64	UNICOS 7.0	Open	99.0%	June 21 — 0400-0700
zeta	CRAY Y-MP8/2-64	UNICOS 8.0	Secure	98.0%	June 28 — 0400-0700
gamma	CRAY Y-MP/M98-82048	UNICOS 7c	Open	99.6%	June 28 — 0400-0700
tau**	CRAY T3D MC512-8	MAX 1.2	Secure	97.9%	June 7 — 0400-0700
	CRAY Y-MP4I/464-2	UNICOS 8.0			
pi**	CRAY Y-MP EL92/1-256	UNICOS 8.0	Open	100%	
cluster	IBM Workstation Cluster	AIX	Open		
beta	VAX 6320	ULTRIX	Open		
CCVAX	VAX 6410	VMS	Open		
OFVAX	VAX 6410	VMS	Open		
canyon	Thinking Machines Corp. CM-200	SunOS	Secure		
tres	Thinking Machines Corp. CM-200	SunOS	Secure		

* Additional downtime for the Cray machines may occur as a result of Network Dedicated Systems Time (NDST). The schedule for possible NDST is from 0600-0700 Mountain Time, Monday through Friday. Should NDST become necessary, a message listing the scheduled downtime will be broadcast on the applicable machines before the actual downtime occurs. For additional information contact the shift supervisor at (505) 667-4584. All times listed are Mountain Time.

** Access restricted.

Questions About Announced Changes?

Notice of all scheduled downtime will be broadcast on the machine before the downtime. For up-to-date machine status and scheduled downtime call: CCF Status Message (505) 667-5588.

Publication Information

ICNchanges Editor/Publication Coordinator
 Barbara Ritchie (CIC-1)
 Mail Stop B295
 Telephone (505) 667-7275

Change Control Coordinator
 Marjorie Johnston (CIC-6)
 Mail Stop B252
 Telephone (505) 667-7309

Accessing Computing Machines through the ICN

This table shows how to access open machines on the ICN through MICOM lines, TCP/IP hosts, and DECnet hosts. Additional machines outside the ICN are accessible through TCP/IP and DECnet. To access any of these machines, except for LIS, you must first establish an ICN account, which includes obtaining an ICN password and registering as an ICN user (contact the CIC Customer Service Center for details).

Example: Suppose you want to access the REGISTER machine from MICOM. By referring to the table, you can see that the appropriate command to enter is TIG. Once you connect to the TIG, enter your ICN user number and password as prompted. At the TIG prompt (tig>) enter register and login to the register machine.

TO →	FROM ↓	Hosts reachable from MICOM Lines:(BETA, CCVAX, IOVAX, OFVAX, STORES, TYMNET, LIS)	TCP/IP Hosts: (BETA, CCVAX, IBM Cluster IOVAX, OFVAX, REGISTER, UNICOS, ACL Hosts, etc.)	DECnet Hosts: (BETA, CCVAX, IOVAX, OFVAX, etc.)
		MICOM Lines	hostname	TIG TELNET hostname
		TCP/IP Hosts (e.g., TIG)	TELNET MICOM hostname	TIG TELNET hostname SET HOST hostname
		DECnet Hosts	TELNET MICOM hostname	TELNET hostname SET HOST hostname or, from BETA DLOGIN hostname

Accessing the ICN through Dialup Modem

Dialup access to the ICN is available through the Terminal Internet Gateway (TIG). The TIG is a gateway to the internet and allows you to telnet to ICN machines as well as other machines. Configure your modem and terminal for 8 bit, no parity, one stop bit. Based on your modem, select the appropriate number listed in the table to dial into the TIG. Then enter your ICN user number and password as prompted. At the TIG prompt (tig>) enter a machine name or IP address.

Report problems to the Network Control Center at 667-7423 Monday through Friday, 6 am to 6 pm or at 667-4585 during non-business hours.

Type of Access	Phone Numbers
Microcom Modems from 300 to 28,800 b/s	(505) 667-9020, 9021, 9022, 9023 (Number of Lines: 16) (800) 443-1461 (Number of Lines: 10)
Microcom Modems from 300 to 14,400 b/s	(505) 667- 9024 and 9025 (Number of Lines: 48)
Note: Use the next phone number if the first does not answer properly.	
Note: The 800 number will only work if you have set the default charge code on the register.lanl.gov machine using the register utility.	
Revised June 1995	

DSC Macintosh Software Order Form

All software listed below, except Netscape, is available at no cost (Netscape costs \$30.00). To order software, fill in the blanks below, check the software you would like to have, and mail this form to

Free Software

Desktop Support Center (CIC-2) MS D445

Name _____ Group _____

Mail Stop _____ Z-Number _____

Cost Code _____ Program Code _____ Account Package _____

Please send the correct number of replacement high-density diskettes with your request. If you don't send any disks, we will send you the software with the understanding that you will return the diskettes after you copy the software.

_____ **FREWARE DISKETTE** (Include one high-density diskette.)

This diskette contains the following software:

Alias Finder: Quickly finds the original of an alias when the alias is dragged on top of the Alias Finder icon.

Disinfectant: Virus protection for the Macintosh.

Disk Copy: Creates copies of diskettes using one floppy drive.

SCSI Probe: Shows connected devices on the SCSI bus.

Stuffit Expander: Unstuffs BinHex 4.0, Stuffit, and other types of compressed files.

Note: The following two applications come with System 7.5:

Extensions Manager: Allows selection of which INITs to load.

SuperClock: Puts a clock in the upper right corner of your Macintosh.

_____ **INTERNET DISKETTE** (Include one high-density diskette.)

This diskette contains the following software:

Fetch: Easy-to-use for FTPing files from FTP archives.

NCSA Telnet: Telnet application

TurboGopher: Gopher client application for the Macintosh.

Stuffit Expander: Unstuffs BinHex 4.0 and other types of compressed files.

_____ **MACINTOSH SYSTEM 7.5** (Include nine high-density diskettes.)

Indicate number of systems on which this System 7.5 will be used: _____

Note: System 7.5 Manuals are available for \$7.50. Enter your accounting information above. CD-ROM version available for free loan. Call 5-1361 for details.

_____ **SYSTEM 7.5 POWERTALK AND QUICKDRAW GX.** (Include four high-density diskettes.)

Note: We recommend that you do not install these parts of System 7.5 unless you have a specific need to do so.

_____ **SYSTEM 7.5 UPDATE, VERSION 1.0** (Include 5 high-density diskettes.) Updates System 7.5, fixes some bugs, speeds up file-sharing, new printer software, etc. Includes Network Software Installer 1.5.

_____ **NETSCAPE** (Include one high-density diskette.)

Netscape is a commercial web browser. Even though it is available on the Internet, it is not free. CIC-2 has bought 1,000 copies of Netscape for a cost of \$30.00 per copy. Enter your accounting information above. We will include a license certificate indicating your purchase. If you do not need a diskette copy of Netscape, check below.

_____ Do not need a diskette. I already have a copy and just need the license.

_____ **ACROBAT READER** (Include one high-density diskette.)

Multi-platform document viewer. Used with viewing "pdf" documents on the LANL web server and fast becoming an Internet standard.

_____ **ACROBAT EXCHANGE** (Include four high-density diskettes.)

An enhanced version of the Acrobat Reader. Allows you to create and annotate "pdf" files as well as read them. Note: CIC Division bought a license of 1,000 copies of Acrobat Exchange. We do not charge for this software but can only distribute 1,000 copies of it (both Mac and PC).

CUT ALONG DASHED LINE

All software listed below, except Netscape, is available at no cost (Netscape costs \$30.00). To order software, fill in the blanks below, check the software you would like to have, and mail this form to

Free Software

Desktop Support Center (CIC-2) MS D445

Name _____ Group _____

Mail Stop _____ Z-Number _____

Cost Code _____ Program Code _____ Account Package _____

Please send the correct number of replacement high-density diskettes with your request. If you don't send any disks, we will send you the software with the understanding that you will return the diskettes after you copy the software.

_____ **DATA PHYSICIAN** Virus detection programs. (Include one high-density diskette.)

_____ **INTERNET DISKETTE** (Include one high-density diskette.)

lview31	A gif/bmp/pic viewer.
tsyncl>8	Set up your pc clock via LANL ftp timeserver automatically.
WS_Ftp	Super ftp client.
WS_Ping	Super ping and nslookup.
pkunzip	File decompression program.

_____ **NETSCAPE** (Include one high-density diskette.)

Netscape is a commercial web browser. Even though it is available on the Internet, it is not free. CIC-2 has bought 1,000 copies of Netscape for a cost of \$30.00 per copy. Enter your accounting information above. We will include a license certificate indicating your purchase. If you do not need a diskette copy of Netscape, check below.

_____ Do not need a diskette. I already have a copy and just need the license.

_____ **ACROBAT READER** (Include one high-density diskette.)

Multi-platform document viewer. Used with viewing "pdf" documents on the LANL web server and fast becoming an Internet standard.

_____ **ACROBAT EXCHANGE** (Include four high-density diskettes.)

An enhanced version of the Acrobat Reader. Allows you to create and annotate "pdf" files as well as read them. Note: CIC Division bought a license of 1,000 copies of Acrobat Exchange. We do not charge for this software but can only distribute 1,000 copies of it (both Mac and PC). Indicate the number of systems on which this copy of Acrobat Exchange will be used: _____

_____ **JETFORM FILLER** (Include five high-density diskettes.)

Form-based document software for use with the LANL's web server on-line forms. Note: CIC-13 bought a license of 2,000 copies of Jetform Filler. We do not charge for this software but can only distribute 2,000 copies of it (Mac version available soon).

Indicate the number of systems on which this copy of Jetform Filler will be used: _____

INTEGRATED COMPUTING NETWORK (ICN) VALIDATION REQUEST

To access ICN Computing resources, please complete all parts of this form that apply to you, including "Special Requirements."

Mail your completed application to:
ICN Password Office (PWO)
Mail Stop: B271
Los Alamos National Laboratory
Los Alamos, NM 87545

If you have questions: Call: (505) 665-1805
E-mail: validate@lanl.gov

All Laboratory computers, computing systems, and their associated communication systems are for official business only. By completing this request, users agree not to misuse the ICN. The Laboratory has the responsibility and authority to periodically audit user files.

Owner Information

Z-Number (if you have one)	PWO Use Only	Name (last, first, middle initial)
LANL Group	LANL Mail Stop	Citizenship (Foreign National see "Special Requirements-Foreign National")
Phone Number	Cost Center	Program Code

Check LANL affiliation:

☐ LANL employee

☐ Contractor _____
(specify contract company)

☐ Consultant, VSM, associate

☐ External user _____
(specify employer)

☐ Other (specify) _____

Send password / smartcard to:

☐ Mail Stop or ☐ Mail to address indicated below

Name / Organization _____

Address _____

City, State, Zip Code _____

Access Check access method and needed partitions:

Access method: ☐ ICN Password ☐ Smartcard ☐ Both

☐ Open partition (e.g., email systems, open machines)

☐ Administrative partition (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS])
If you are not a Q-cleared LANL employee, see required steps in section "Special Requirements-Administrative Partition," unless you already have Administrative access with an ICN password.

☐ Secure partition (i.e., secure machines)
Indicate level(s) of data to be processed:

☐ Unclassified

☐ Secret

I certify this person does require secure access:

Manager Signature (Group Leader or above)

Date

NOTE: A Q-clearance is required. All classified computing must be performed within the Secure environment.

PWO Use Only

New <input type="checkbox"/>	Change <input type="checkbox"/>	Clearance Status	Processed	Lv	Smartcard Serial #
Comments:					

Special Requirements

Administrative Partition

(U.S. Citizens Only)

Lab-Wide Systems (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS])

☐ Under 18
years of age

If you need to access Administrative systems, your group leader must provide a memo accepting responsibility for your actions and justifying your need for access. This memo is to accompany all forms taken to the security briefing (see "Contractor or Non-Q-Cleared") section below. You may not access the Secure Partition.

☐ Contractor or
Non-Q-Cleared

Phone (505) 667-9444 to obtain Access Authorization packet.

Phone (505) 667-9153 to schedule a security briefing.

Bring all forms including this ICN Validation Request to the security briefing for approval.

Security Briefing Approval Signature

Date

☐ Foreign National

Attach a copy of Form 982 (REQUEST FOR UNCLASSIFIED VISIT OR ASSIGNMENT BY A FOREIGN NATIONAL) with all approval signatures. Be sure Box #11 of Form 982 is completed. If you are not a visitor/assignee under a LANL/DOE approved Visit / Assignment Request, attach written justification from your host Division Director describing your need to access the ICN.

Authorization (required)

Print Manager Name (Group Leader or above)

Manager Z-Number

Group

Manager Signature (Group Leader or above)

Mail Stop

Date

If you are NOT a LANL employee, obtain your LANL contact's signature in addition to the contact's manager's signature.

NOTE: LANL contacts are regular Laboratory employees. Contacts are responsible for obtaining annual re-authorizations, forwarding renewals, and notifying the ICN Password Office of changes in user or contact status.

Print LANL Contact Name

Contact Z-Number

Phone Number

Group

LANL Contact Signature

Mail Stop

Date

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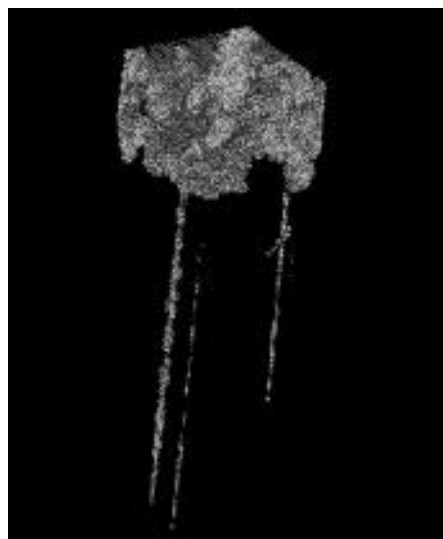
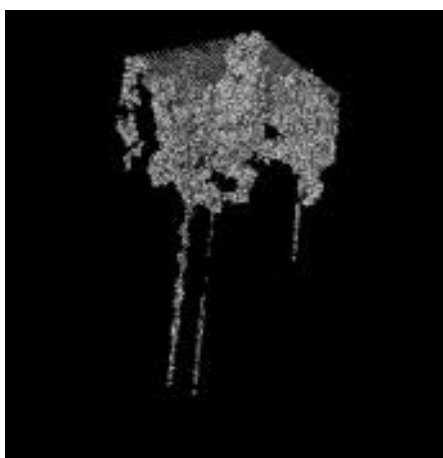
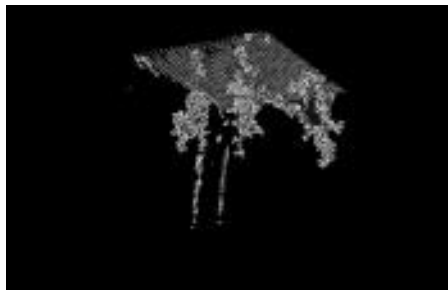
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These images depict a silicon wafer at different intervals after it has been bombarded by silicon atoms. The atoms shown below the wafer's surface simulate the damage caused by the bombardment. This work is done in collaboration with the Semiconductor Research Corporation. Simulation and visualization were performed at the Advanced Computing Laboratory. The work was carried out by Niels Gronbech-Jensen (T-11), Peter S. Lomdahl (T-11), David M. Beazley (University of Utah), Tim Germann (Harvard), and Mike Krogh (ACL).

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